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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/579,211

05/12/2006

Toshihiko Shirasagi

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RADER FISHMAN & GRAUER PLLC

LION BUILDING

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WASHINGTON, DC 20036

EXAMINER

VERDERAME, ANNA L

ART UNIT

PAPER NUMBER

1795

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/579,211

Applicant(s)

SHIRASAGI ET AL.

Examiner

ANNA L. VERDERAME

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 4-7 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4-7 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S508)
- Paper No(s)/Mail Date 10/20/2008
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

The response filed on 12/03/2008 has been carefully considered. A response is presented below.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4-7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kouchiyama et al. JP-2003-315988 or Kouchiyama et al. WO 2004/034391(US 2005/0226999 used as an English language translation) in view of Saito et al. US 4,786,538 Yamada et al. 4,916,048, and Lee et al. JP-2001-344826(English translation provided) .

Kouchiyama et al. '988 teaches a method of micro-fabrication wherein a resist layer including an incomplete oxide of W or Mo is patterned to prescribed shapes by selectively exposing and developing the layer. The incomplete oxide of a transition metal refers to a compound deviated to a direction where the oxygen content is lower than that of a stoichiometric composition (abstract). The resist of the incomplete inorganic oxide is formed by sputtering a target of a transition metal in an atmosphere containing argon and oxygen. The degree of oxidation of the incomplete oxide is controlled by changing the oxygen content in the atmosphere. Varying the oxygen

content, the addition of a second transition metal, and the provision of an interlayer are disclosed as methods for increasing the sensitivity of the resist (0059-0063).

Kouchiyama et al. '391 teaches a method for forming an optical disc master comprising the steps of forming an interlayer 101 and a resist layer 102 on a substrate 100, selectively exposing the resist, and developing the resist to form a patterned master [(WO/page 10)/(0048-0049)]. The material of the resist includes an incomplete oxide of a transition metal such as Mo or W oxide. In order to form the resist layer composed of an incomplete oxide sputtering can be performed in an atmosphere containing oxygen with the metal target or alternatively can be formed in an argon atmosphere with a target of an incomplete metal oxide [(WO/page 13)/(0068)]. In order to control the sensitivity of the resist according to the present invention the oxygen content of the material is increased or decreased [(WO/page 19)/(US/0089)].

In example 1 a resist of an incomplete oxide of tungsten is formed on a glass substrate. The content of oxygen gas in the atmosphere of argon and oxygen was changed in order to control the degree of oxidation of the incomplete oxide [(WO/page 23)/(US/0108)]. The resist was then exposed and developed [(WO/ page 24)/(US/0107-0115)].

In example 2 a resist material of an incomplete oxide of W and Mo was used[(WO/page 25)/(US/0119-0120)]

Kouchiyama et al. '391 and '988 do not teach varying the oxygen concentration so that the concentration near the surface of the substrate is lower than the

concentration at the surface of the resist. Further, both references do not teach the formation of concavo/convex structures of different depths.

Saito et al. teaches varying the oxygen content in the thickness direction of a photosensitive TeO_x film. Thereby the medium obtained may be extremely stable and has excellent adhesive properties between the substrate (abstract). A tellurium or tellurium sub-oxide layer and/or a tellurium dioxide layer are laminated or a tellurium dioxide layer and/or a tellurium or tellurium sub-oxide layer are laminated (2/28-41). See description of figure 1 and figure 2(2/60-65).

In example 4 a film is formed wherein a film of $\text{TeO}_{0.1}$ is formed near the surface of the substrate and the oxygen content is increased toward the surface of the photosensitive layer. The surface of the photosensitive layer has a composition of TeO_2 (8/5-31).

Yamada et al. teaches photosensitive sub-oxide materials including WO_x , MoO_x , and TeO_x (abstract).

The teachings of Yamada et al. are used to show that the teaching to vary the oxygen content in a TeO_x film will likely produce the same results in WO_x and MoO_x films. Yamada et al. teaches that these films are interchangeable.

Lee et al. teaches a disc manufacturing method in which grooves and pits having different depths are formed by changing the power of the laser beam(abstract). See figures 2A-B.

It would have been obvious to modify the manufacturing method of Kouchiyama et al. '391 and '988 by varying the oxygen content in the inorganic photosensitive layer so that the concentration of oxygen at the surface of the resist layer is higher than that at the surface of the substrate or in which the oxygen content is higher at the surface of the substrate and lower at the surface of the resist based on the example of Saito et al. and based on the teaching of equivalence between TeO_x and MoO_x or WO_x by Yamada et al. and with the reasonable expectation of forming an extremely stable master having excellent adhesive properties between the substrate. Further, it would have been obvious to one of ordinary skill in the art to form concavo/convex structures having different depths by changing the laser power based on the disclosure of Lee et al.

Response to Arguments

3. The rejection of claims 1-2, 4-5,8 and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Kouchiyama et al. JP-2003-315988 or Kouchiyama et al. WO 2004/034391(US 2005/0226999 used as an English language translation) in view of Miura et al. JP-02-029955 is withdrawn due to cancellation of claims 2 and 8.

It is the position of the examiner that claim 7 was also addressed in this rejection and just not included in the rejection heading. The basis for this position is the further rejection of claims 8 and 10 which depended upon claim 7.

4. Applicant's arguments filed 12/03/2008 have been fully considered but they are not persuasive. The applicant argues that the examiner has not established a connection between the types of sub-oxide resists taught by Kouchiyama et al. ' 988

and '224 and those taught by Saito et al. However, this is incorrect. First, the resist materials used in Kouchiyama et al. '988 and '224 are all inorganic sub-oxide(incomplete-oxide) resists. Second, the examiner has cited Yamada et al. which discloses photosensitive sub-oxide materials including WO_x , MoO_x , and TeO_x . TeO_x is disclosed by Saito et al. and WO_x and MoO_x are cited by Kouchiyama et al. '988 and '244. Therefore, as stated in the office action Yamada et al. teaches equivalence between the types of resists used in Saito et al. and those used in Kouchiyama et al. '988 and '244. Therefore, one of ordinary skill in the art would look to the teachings of Saito et al. based on his disclosure pertaining to inorganic sub-oxide resists which are shown to be equivalent.

The applicant further argues that Yamada et al. does not disclose incomplete oxides of transition metals. In response the examiner notes that Yamada et al. discloses W and Mo which are also cited by Kouchiyama et al. '244 and '988 as examples of transition metals for incomplete oxides of transition metals. Further, one of ordinary skill in the art would appreciate that the notation TeO_x refers to an incomplete oxide where x varies and would further recognize that the notation TeO_2 refers to a complete or stoichiometric oxide. See also section 5/12/38 of Yamada et al.

Lee et al. like Kouchiyama et al. '244 and '988 refers to a mastering process and is therefore analogous art. Lee et al. discloses formation of grooves and pits having different depths. One of ordinary skill in the art would want to form a master having grooves and pits of different depths based on the disclosure of Lee et al. and the

existence of optical discs having pits and grooves having different depths in the prior art.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA L. VERDERAME whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark F. Huff/
Supervisory Patent Examiner, Art Unit 1795

/Anna L Verderame/
Examiner, Art Unit 1795